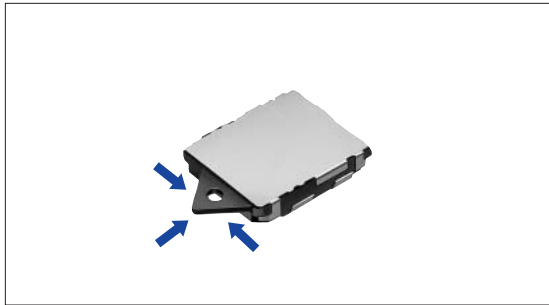


Detector Switch Low-profile Tri-directional Operation Type

SPVL Series



Flexible operation in arrangement at a 180° angle, and only 1mm thickness.



Features

- Tri-directional operation (vertical, right or left over a range of 180°).
- Double-sided sliding contact provides high reliability.
- Reflow solderable.

Applications

- For detection mechanisms in devices, including personal digital assistants, IC recorders, silicon audio systems, car audio systems, and digital camcorders

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line
Package Type

Multi Control
Devices

TACT Switch™

Custom-
Products

Typical Specifications

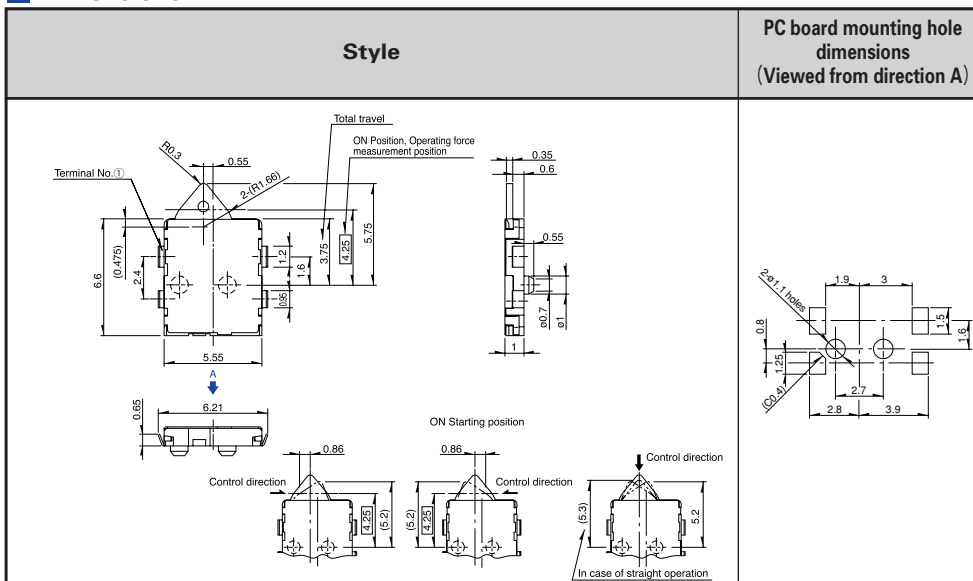
Items		Specifications
Rating (max.) / (min.) (Resistive load)		1mA 5V DC/50μA 3V DC
Contact resistance (Initial performance/After lifetime)		2Ω max./5Ω max.
Operating force		0.35N max.
Operating life	Without load	50,000 cycles
	With load	50,000 cycles (1mA 5V DC)

Products Line

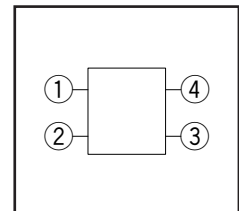
Poles	Positions	Terminal style	Location lug	Products No.
1	1	For PC board (Reflow)	With	SPVL110100
			Without	SPVL120100

Dimensions

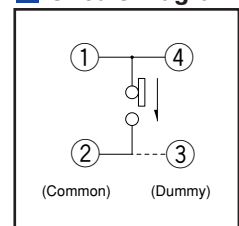
Unit:mm



Terminal Layout (Viewed from Direction A)



Circuit Diagram



Note

Only the configurations with the location lug are indicated in the dimensions.

For other specifications, see P.69
For specifications for the taping package, see P.73

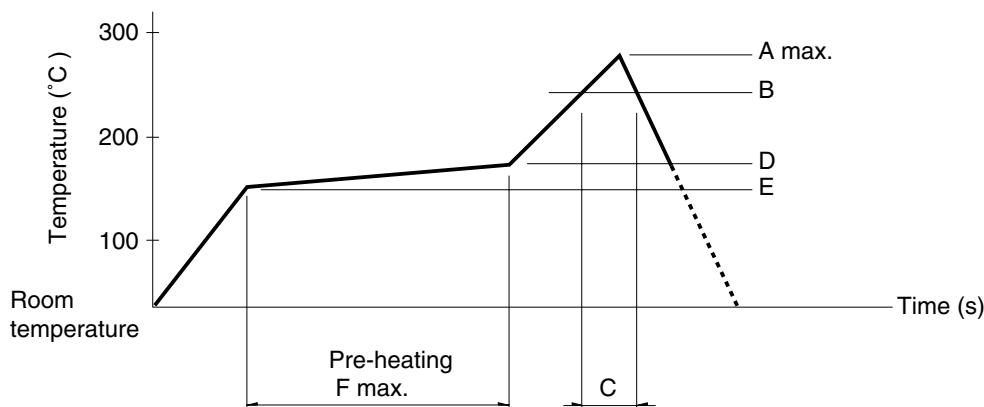
Products Specifications

Items		Series											
		SPVP	SPVC1	SPVN	SPVS	SPVG	SSCW	SPVL	SPVQ1	SPVQ3	SPVQ4	SSCN	
Detector	Operating temperature range	-10°C to +60°C					-40°C to +85°C	-10°C to +60°C	-40°C to +85°C				
	Rating (max.) (Resistive load)	1mA 5V DC	10mA 16V DC	1mA 5V DC		50mA 20V DC	0.1A 12V DC	1mA 5V DC	0.1A 12V DC				
Push	Electrical performance	Initial contact resistance		5 Ω max.	1 Ω max.	2 Ω max.		500mΩ max.		2 Ω max.	500mΩ max.		
Slide		Insulation resistance		100MΩ min. 100V DC				100MΩ min. 250V DC	100MΩ min. 100V DC	100MΩ min. 500V DC			
Rotary		Voltage proof		100V AC for 1 min.				250V AC for 1 min.	100V AC for 1 min.	500V AC for 1 min.			
Encoders	Mechanical performance	Robustness of terminal		0.5N for 1 min.	3N for 1 min.	0.5N for 1 min.		—	1N for 1 min.	3N for 1 min.			
Power		Robustness of actuator		5N	10N	5N	10N	20N	5N	20N		10N	
Dual-in-line Package Type		Vibration		10 to 55 to 10Hz/min., the amplitude is 1.5mm for all the frequencies, in the 3 direction of X, Y and Z for 2 hours respectively									
Multi Control Devices	Resistance to soldering heat	Manual soldering		350±5°C, 3s max.	350±10°C, 3 ⁺¹ s	350±5°C, 3s max.		—	350±5°C, 3s max.	300±10°C, 3 ⁺¹ s			
TACT Switch™		Dip soldering		—	260±5°C, 3s max.	—		—	—	260±5°C, 5±1s		—	
Custom-Products		Reflow soldering		Please see P.72	—	Please see P.72		—	Please see P.72	—			
Durability	Operating life without load		50,000 cycles 10Ω max.	25,000 cycles 2Ω max.	50,000 cycles 5Ω max.		100,000 cycles 1Ω max.		50,000 cycles 5Ω max.	300,000 cycles 1Ω max.	300,000 cycles or 1,000,000 cycles 1Ω max.	300,000 cycles 1Ω max.	100,000 cycles 1Ω max.
	Operating life with load		(1mA 5V DC) 50,000 cycles 10Ω max.	(10mA 16V DC) 25,000 cycles 2Ω max.	(1mA 5V DC) 50,000 cycles 5Ω max.		(50mA 20V DC) 100,000 cycles 1Ω max.	(0.1A 12V DC) 100,000 cycles 1Ω max.	(1mA 5V DC) 50,000 cycles 5Ω max.	(0.1A 12V DC) 300,000 cycles 1Ω max.	(0.1A 12V DC) 300,000 cycles or 1,000,000 cycles 1Ω max.	(0.1A 12V DC) 300,000 cycles 1Ω max.	(0.1A 12V DC) 100,000 cycles 1Ω max.
Environmental performance	Cold		-20±2°C for 96h				-40±2°C for 96h	-40±2°C for 500h	-20±2°C for 96h	-40±2°C for 500h			
	Dry heat		85±2°C for 96h				85±2°C for 500h	85±2°C for 96h	85±2°C for 500h				
	Damp heat		40±2°C, 90 to 95%RH for 96h				60±2°C, 90 to 95%RH for 500h	40±2°C, 90 to 95%RH for 96h	60±2°C, 90 to 95%RH for 500h				

Soldering Conditions

Example of Reflow Soldering Condition

1. Heating method: Double heating method with infrared heater.
2. Temperature measurement: Thermocouple 0.1 to 0.2 ϕ CA (K) or CC (T) at soldering portion (copper foil surface). A heat resisting tape should be used for fixed measurement.
3. Temperature profile



Series (Reflow type)	A (°C) 3s max.	B (°C)	C (s)	D (°C)	E (°C)	F (s)
SPPB	250	230	40			
SPPW8		200	20			
SPVE	260	230	40	180	150	120
SPVG						
SPVL						
SPVM						
SPVN						
SPVP						
SPVR						
SPVS						
SSCM						
SPPY5						

Notes

1. The condition mentioned above is the temperature on the mounting surface of a PC board. There are cases where the PC board's temperature greatly differs from that of the switch, depending on the PC board's material, size, thickness, etc. The above-stated conditions shall also apply to switch surface temperatures.
2. As the conditions vary some how depending on the kind of reflow soldering equipment, please make sure you have the right one before use.

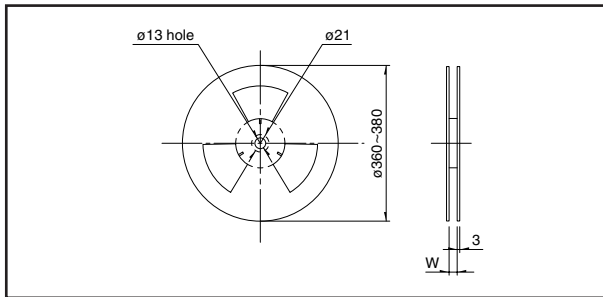
- Detector
- Push
- Slide
- Rotary
- Encoders
- Power
- Dual-in-line Package Type
- Multi Control Devices
- TACT Switch™
- Custom-Products

Taping Specifications

Taping Packaging

Reel Size

Unit:mm



Series		Number of packages (pcs.)			Reel width W (mm)	Tape width (mm)
		1 reel	1 case / domestic	1 case / export packing		
SPPB	53 (Horizontal)	1,500	3,000	6,000	24.4	24
	53 (Vertical)	600	1,200	2,400		
	63, 64	1,300	2,600	5,200		
SPPW81	h = 6.1 (Reflow)	1,000	2,000	4,000	12.4	12
	h = 6.55 (Reflow)					
	h = 7.6 (Reflow)	850	1,700	3,400		
SPVE	Standard	h=3.8	2,800	5,600	12.4	12
		h=4.1				
		h=4.8	2,200	4,400		
		h=5.2	2,000	4,000		
		h=5.5				
	Low-profile	h=3.3	2,800	5,600		
SPVG		2,500	5,000	10,000	16.4	16
SPVL		5,000	10,000	20,000		
SPVM		3,000	6,000	12,000		
SPVN		5,000	10,000	20,000		
SPVP		4,500	9,000	18,000		
SPVR		2,500	5,000	10,000		
SPVS		5,000	10,000	20,000		
SSCM		3,000	6,000	12,000		
SPPY5		550	1,650	3,300		

Note

Order products in N minimum packing units (1 reel or 1 case).

Detector

Push

Slide

Rotary

Encoders

Power

Dual-in-line Package Type

Multi Control Devices

TACT Switch™

Custom-Products